

# Machine Tool Technology Instructors! Proven Curriculums To Help You Teach CNC Classes

from CNC Concepts, Inc.



Right out of the box, these curriculums come with everything you need to teach CNC courses. Curriculums include:

- ❖ CNC Machining Center Programming, Setup, and Operation
- ❖ CNC Turning Center Programming, Setup, and Operation
- ❖ CNC Setup Reduction
- ❖ CNC Cycle Time Reduction
- ❖ Maximizing CNC Utilization

Find out how to get the instructor's materials  
**FREE!** See the last page for details!

Dear Educator,

**Thank you** for your interest in our CNC curriculums. The following pages will provide you with an overview of how our curriculums can help you teach CNC classes.

Since CNC usage is a very broad and complex topic, this overview may not answer all of your questions or show you all you need to know. So we've also included a sample Student Manual and a Samples Disk to help you learn more. The sample Student Manual will show you just how comprehensive your support material will be when you use one or more of our curriculums. The Sample Disk includes all written Instructor's Material from each of our curriculums as well as the entire slide show (with audio guidance) for the first lesson. If of course, you still have questions after viewing this material, please contact us (847-639-8847).

Again, thank you for your interest in our materials.

### **This samples disk includes:**

❖ **All written instructor materials in Adobe Acrobat (.pdf) format:**

- What's new
- Getting started
- Hard copy of review slide presentation
- Course outline
- Answer book
- Final test with answers
- Entire Instructor Notes manual
- Portion of the Student Manual

❖ **PowerPoint presentation for lesson one (each curriculum) including audio guidance**

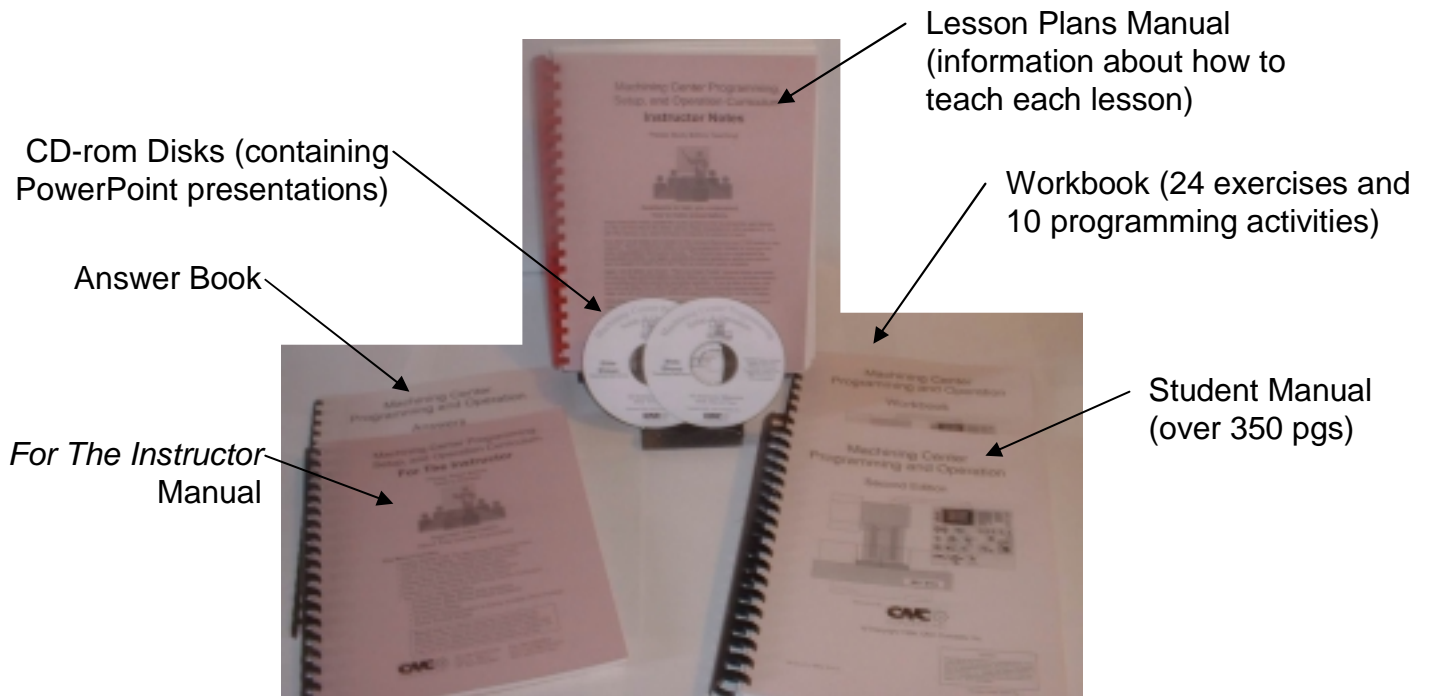
❖ **Samples of other CNC Concepts, Inc. products**

# What's Included With Each Curriculum?

Curriculums are available to help you teach:

- ❖ CNC Machining Center Programming, Setup, and Operation
- ❖ CNC Turning Center Programming, Setup, and Operation
- ❖ CNC Setup Reduction
- ❖ CNC Cycle Time Reduction
- ❖ Maximizing CNC Utilization

(By far, the two Programming, Setup, and Operation curriculums are our most popular. We limit information in this overview to these two curriculums.)



Machining Center Programming, Setup, and Operation Curriculums shown

Each curriculum includes:

❖ **Instructor materials**

- For The Instructor Manual – Provides information about how to get started, the course outline, answers to exercises, and a final test with answers
- Lesson Plans Manual – Information and guidance to help you teach each lesson
- PowerPoint presentations – Provide the visuals for your lectures – There is one presentation for each lesson
- PowerPoint Viewer software – To show your presentations (if you have PowerPoint, you don't need this viewer)

❖ **Student materials**

- Comprehensive manual (over 350 pgs) – parallels class presentation and makes an excellent reference after the course is finished
- Workbook – contains practice exercises and programming activities

# Will You Like Our Teaching Methods?

A well structured course will maximize the potential for successful learning. Here are some of the design concepts for our CNC curriculums.

## **Course objectives that meet student needs**

If you have solicited suggestions from manufacturing people, you've heard what they want most – people that understand what it takes to get a machine up and running – people that can keep machines running production – people that can solve problems when they arise – and in general – people that can step in and be productive right away. These curriculums help you teach students what they truly need in the *real world* of manufacturing – and minimize the in-plant training a company must do once students complete your course/s.

## **Light at the end of the tunnel**

Our *key concepts approach* minimizes the number of important principles a student must master to successfully complete your course. There are but ten key concepts – six are related to programming and four are related to setup and operation. Students will know exactly where they stand each step of the way.

## **Logical and progressive flow**

The ten key concepts are further divided into lessons. Each lesson takes the student from what they know to what they don't know – gradually building the students' understanding.

## **Support materials that parallel presentations**

Since each student learns at a different pace, they must have a way to study and review class material on their own. The student manual provides them with material that reinforces what you've taught in class – giving them a way to view the content from two perspectives.

## **Persistent review of material**

Students retain only a small percentage of what they hear the first time. The longer the session, the less they retain. We recommend starting each session with a review of previously presented material. Indeed, some sessions should be made up entirely of review – especially if you find that students are becoming overly confused or frustrated. Our *review presentation* – which is intended to help you remember key topics for reviewing, along with the presentation links slide included in each lesson will help you go over key topics as often – and as in as much depth – as your students need.

## **Proven public speaking style**

Each lesson begins with a lesson plan slide to help you prepare students for what is coming. You then present the content for the lesson. At the completion of each lesson, there is a summary slide to help you review the key points in the lesson. This method allows you to

- *Tell them what you're going to tell them*
- *Tell them*
- *Tell them what you told them*

## **Fair and accurate way to gauge success**

The workbook includes realistic exercises and programming activities. Students doing well with the exercises will do well when working with CNC machine tools. We also provide a final test (with answers) to help you gauge overall comprehension at the course completion.

### **Want to know more about our teaching methods?**

On the Samples Disk, you'll find Adobe Acrobat (.pdf) files that include much more information. Look in the folder named *Instructors Curriculum Samples*. You'll find a folder named *Written Samples*. All written instructors materials for each of our curriculums is included for you to see. You'll find a list of lessons and an outline for each course, an answer book, and a hard copy for the review presentation. We've also included an entire student manual for your evaluation.

# What Is The Scope Of Each Curriculum?

As the name of each curriculum implies (Machining Center Programming, Setup, & Operation and Turning Center Programming, Setup & Operation), these curriculums cover all three tasks a student must master in order to become proficient with CNC machine tool usage: programming, setup, and operation.

## Prerequisites

We assume nothing about the students prior understanding of CNC and begin from scratch. We do, however, assume the student has some previous basic machining practice experience. Topics like blueprint reading, shop math, gauging tools, cutting conditions, and hand tools are among the things students should understand prior to taking one of these classes. It's likely your school has other classes that cover these prerequisites.

## Programming

The first six key concepts are devoted to programming. We're stressing G code level (manual) programming methods. While there are other programming methods available, all CNC programmers must understand G code level programming methods. Without an understanding of G code programming, a programmer will not be able to make even the simplest modifications at the CNC machine when problems arise.

## Setup

Many implications of how setups are made are discussed during the programming discussions. For example, the feature fixture offsets, which is a setup-related function, is first discussed during the discussion of program zero in the programming discussions. So by the time you get to the setup portion of the course, students will already understand many setup related functions – at least in principle.

You'll be presenting the tasks that are required to make setups in the approximate order that setups are made. These tasks include workholding setup, program zero assignment cutting tools, program loading, and program verification.

## Operation

By operation, we actually mean two things. First you'll be presenting information needed to master general machine operation – like buttons & switches, machine power-up, loading programs, jogging axes, and running programs (and more). Second, you'll be helping students understand what it takes to complete a production run once a setup has been made. Topics include workpiece load/unload, program execution, monitoring critical dimensions and making sizing adjustments due to tool wear, tool replacement, and trial machining with new tools.

## What's next?

Upon successful completion of one of these courses, the student will be ready to approach the CNC machine with confidence. They will have a substantial foundation in CNC machine usage. They will also understand enough about basic CNC to do well in a more advanced course related to computer aided manufacturing (cam) system usage – which your school may also offer.

## Controls covered

While the key concepts can be easily applied to just about any CNC control, specific examples throughout the class are given for the **FANUC** control. Fanuc is the most popular control manufacturer in the industry. Additionally, many control manufacturers claim to be *Fanuc-compatible* (like Haas, Yasnak, Mistubishi, Mazak eia, Flashcut, Seikos, and others). Almost all companies that have CNCs have at least one machine with one of these controls.

### Want to know more about scope of each curriculum?

On the Samples Disk, you'll find Adobe Acrobat (.pdf) files that include much more information. Look in the folder named *Instructors Curriculum Samples*. You'll find a folder named *Written Samples*. The course outline for each curriculum (in the *For The Instructor* manual) will show you every topic that is covered. You'll see that these curriculums are extremely comprehensive!

# How Do We Help You Get Ready To Teach?

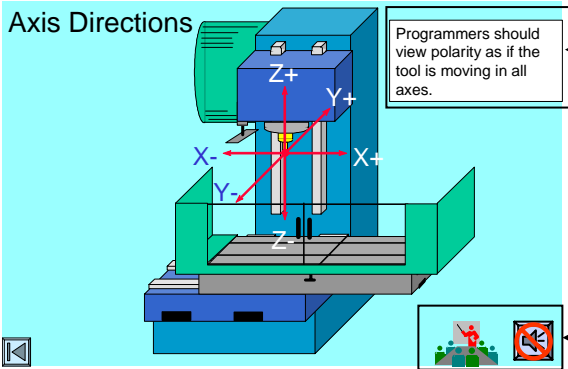
While we don't completely eliminate your need to prepare, we do dramatically simplify the task. We do, of course, eliminate the need to *develop* the curriculum. You'll simply need to learn how to use the materials that have been prepared.

## **Instructor Notes manual (in PDF format)**

We've picked key slides from each lesson and provided notes to you to help you understand what must be presented. This large manual (over 600 pages if you elect to print it) provides you with help at every change in topic. Here's a page out of this manual:

Slide 74      Instructor Notes      Lesson one

**Axis Directions**



Programmers should view polarity as if the tool is moving in all axes.

Point out that programmers should view polarity as if the tool is moving in all axes. And this slide nicely illustrates polarity in this fashion. Note that tool movement to the right is X plus. But as the next series of slides will help you illustrate, the tool doesn't actually move in the X axis for a C frame style vertical machining center. Instead, the table moves to form the X axis. To get a motion that makes the tool move to the right (X plus), the table must move to the LEFT. So table motion to the left is X plus. The same confusion will exist for the Y axis, since the table moves to form the Y axis. But no such confusion will exist with the X axis, because the tool actually does move along with the Z axis (headstock motion).

## **Audio guidance**

We've also included audio guidance on key slides (the same slides picked for the Instructor Notes manual). As you're stepping through the slides for a lesson – getting ready to teach – you'll can click this icon to have an audio narration played. This narration will help you understand what is supposed to be said at this point in the presentation. Note that this guidance is intended for *you* to hear, not your students.

## **Fly-in text boxes**

Some of the slide shows are pretty long. Even with the Instructor Notes manual and the audio guidance to help you prepare, you may be confused during your presentation – right in front of your students. For this reason, we've include hundreds of fly-in text boxes in each course. These text boxes will help you stay on track, helping to jog your memory to remember what it is you're supposed to be talking about as your presentation changes gears. In many cases, they can be thought of as the first sentence you will say as you come to a transition in the presentation.

## **For The Instructor manual**

Providing you with specific instructions for teaching with the curriculum, this manual includes getting started, a hard copy of review presentation, a course outline, an answer book, and the final test with answers.

## **Lesson Plans manual**

This concise information will give you a quick overview of what is in each lesson – and will provide suggestions about how course material should be related.

## **Full course outline**

This six page document provides you with every main- and sub-topic you'll be presenting during the class. Organized by Key Concept and lesson number, this outline shows the approximate slide number from which each topic begins.

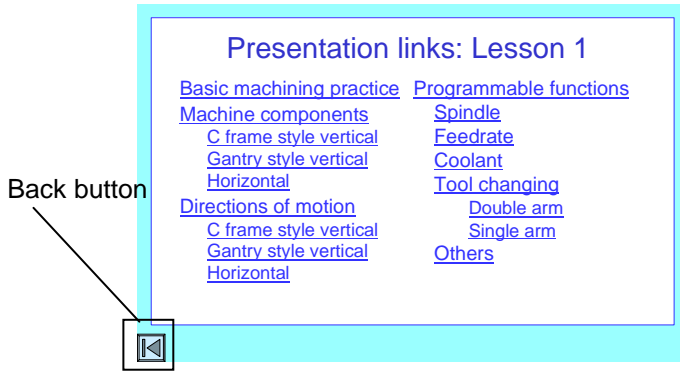
## **Want to know more about how we help you get ready to teach?**

Again, look on the Samples Disk in the folder *Instructors Curriculum Samples* for the folder named *Written Samples*. You'll find the complete "*For the Instructor*" manual (you can find the course outline in this manual) as well as the complete "*Instructor Notes*" and "*Lessons Plans*" manuals. Also be sure to check out the PowerPoint presentation for the first lesson (it's also on the samples disk in the folder named "*Slide Shows*"). You can see the audio guidance icons and hear audio guidance as well as see how the fly-in text boxes will keep you on track!

# What's Special About The Slide Presentations?

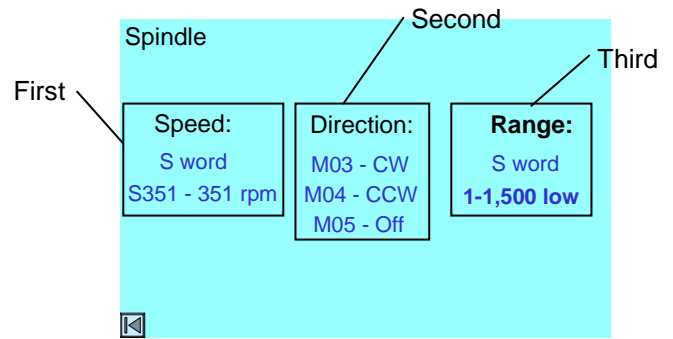
## Presentation links slides

Each presentation includes one of these slides that allows you to quickly jump to any major topic in the lesson. Every slide in the lesson includes a *back button* to return you to this slide.



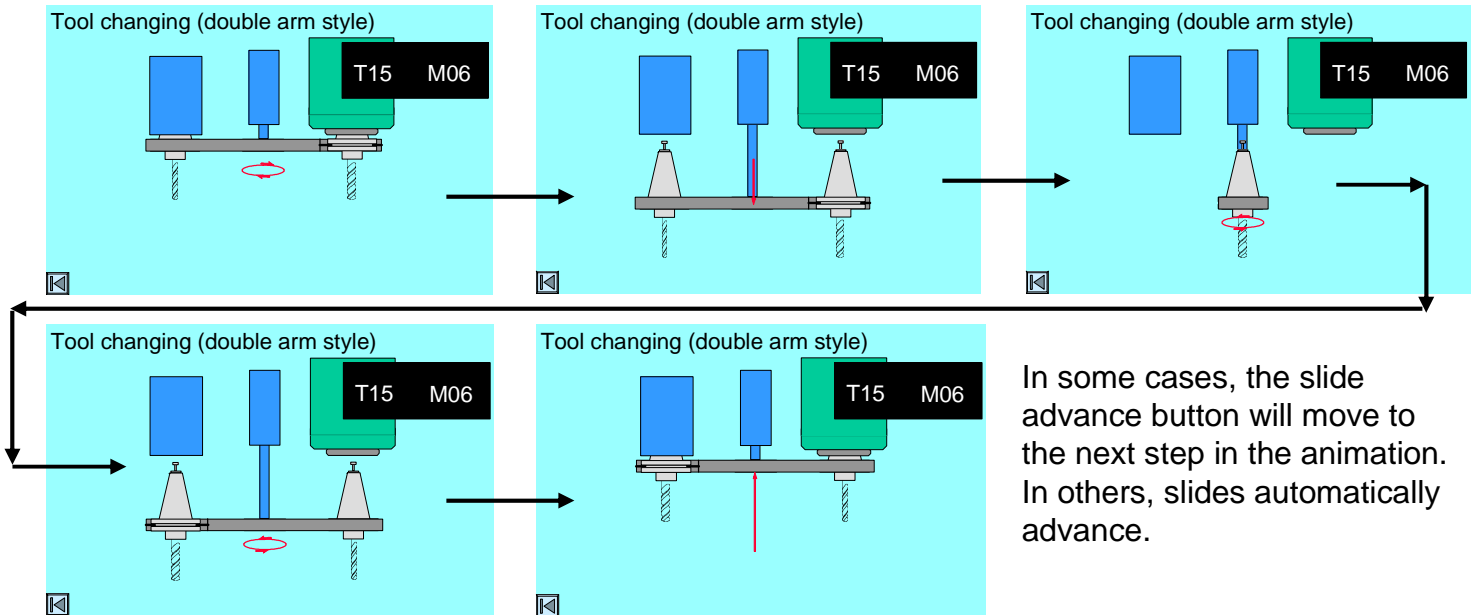
## Build slides

Many – indeed most – slides *build up* as you advance slides. This lets you present complex topics in small pieces, concentrating on the point at hand before moving on to the next.



## Animations

We animate many of the slides (actually combinations of slides) to help you illustrate motion. Examples include tool motion, axis motion, and tool changes.



In some cases, the slide advance button will move to the next step in the animation. In others, slides automatically advance.

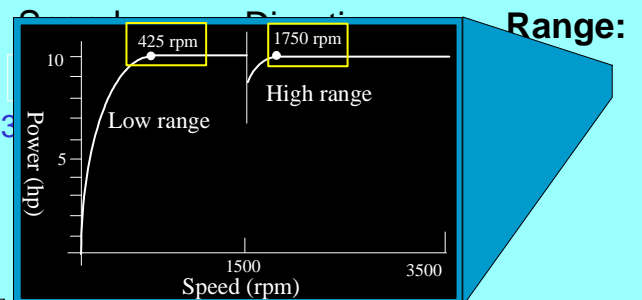
## Complex topics made simple

If a picture is worth a thousand words, these presentation will save you millions of words. Each curriculum includes over 5,000 slides! Throughout each course, you'll be able to make difficult points with ease.

### Want to know more about the slide shows?

You can see the entire slide show for lesson one of each curriculum on the Samples Disk. You can see how the *presentation links slide* and *back buttons* let you quickly jump to major topics, see many build slides and animations, and in general, see just how good your presentations can be!

## Spindle





# Other Questions You Probably Have

## How much does it cost to get started?

Believe it or not, the instructor's materials for these curriculums are **FREE** with your school's initial order for student materials. We do ask that your initial purchase be for at least twenty sets of student materials. Student Manuals sell for \$60.00 each and Workbooks are \$19.95 each (for the Machining Center and Turning Center curriculums). You can purchase additional student materials in any quantity at any time. Since your school (or the school's bookstore) will be selling these materials to students, *your first twenty students will be paying for the instructor's materials!*

## What is your return policy?

Since we are providing you with free instructor's materials, we do not accept returns from your bookstore for initial order (unless you also return the instructor's materials). After the initial order, the bookstore may return up to 30% of the order within 90 days of receipt. A 25% restocking charge will be applied. *Be sure your school bookstore understands our return policy.*

## How do we get started?

Simply call (847-639-8847) and let us know when your bookstore will be placing the initial order. We'll need the instructor's shipping address since we ship the instructor's materials separately from the student materials.

## We've already developed our own curriculum, but can we use your manuals?

Yes, we do offer Student Manuals (and Workbooks) separately. The Student Manuals make excellent textbooks for any CNC class. Though we feel our curriculums will help you immensely, we do not force you to use them. You can purchase any quantity of manuals at any time at the prices shown above.

## Do you have more questions?

Again, we've tried to answer as many questions as possible with this overview, sample Student Manual, and Samples Disk. But if you have more questions, please contact us at 847-639-8847.

## What if I have questions while getting started?

We offer free phone assistance to instructors that have questions. Simply give us a call or email to discuss your question or problem.

## Do you help us promote CNC courses?

Actually, we'll help any CNC-teaching school to promote their CNC courses, regardless of whether they're using our curriculums. On our website ([www.cncci.com](http://www.cncci.com)), we maintain a free CNC schools page. Simply fill out a school listing form and we'll post your school – including a link to your school's website. By the way, about half the schools listed on our schools page are using one or both of these curriculums!

## Who else is using these curriculums?

Again, about half the schools listed on our schools page are using our curriculums. They include (among others):

- Calhoun Community College
- Pulaski Technical College
- Ouachita Technical College
- Fresno City College
- Fullerton College
- Cerritos College
- Lanier Tech
- Coosa Valley Technical College
- Ogeechee Technical College
- Rock Valley College
- Ivy Tech State College
- Des Moines Area Community College
- Hennepin Technical College
- St. Cloud Technical College
- Maple Woods Community College
- Broome Tioga BOCES
- Corning Community College
- Catawba Valley Community College
- Francis Tuttle Tech Center
- Tennessee Technology Center
- Central Virginia Community College
- Gateway Technical College
- Fanshawe College

Join this list of successful schools today!